REMARKS

This amendment is submitted in Response to the outstanding Office Action dated April 28, 2009. The Office Action has been reviewed, and reconsideration of the application and allowance thereof are requested based on the following remarks.

The objection to Claim 29 has been considered. Claim 29 has been amended so that Claim 29 depends on Claim 23 rather than cancelled Claim 22. Therefore, withdrawal of the objection is respectfully requested.

Claims 14-16, 23, 26-29 stand rejected under 35 USC §103(a), as being unpatentable over Sanz-Pastor et al., U.S. Patent No. 6,747,649, in view of Solomon, U.S. Patent No. 6,493,858. Applicants respectfully traverse this ground of rejection and urge that the presently claimed invention is patentably distinguishable over the prior arts cited by the Examiner.

Claim 14 is directed to an apparatus for automatically generating a mipmap chain of texture images from a portion of texture image data for use in texturing a computer graphic image in a tile-based rendering system comprising:

means for supplying texture data;

means for allocating the texture data to at least one tile;

means for storing the texture data allocated to each tile in a tile buffer;

means for filtering the texture data in the tile buffer for each tile and generating at least one lower level of mipmap data from the texture data;

means for temporarily storing each lower level of the mipmap data in the tile buffer; and

means for storing each lower level of the mipmap data in a system main memory,

wherein the filtering means and the temporarily storing means generate a predetermined number of mipmap levels to form the mipmap chain of the texture images.

Sanz-Pastor discloses the image pyramid with many different layers of the texture of different resolution. All of these layers are stored in the compressed form, and all the different layers of the mipmap data are stored in the image pyramid. In column 12, lines 48-65, Sanz-Pastor clearly teaches the different levels of the image pyramid stored in the tiles and the method how the tiles are fetched from the database. Thus, all the different levels of the mipmap data are stored.

However, Sanz-Pastor does not disclose the means for filtering the texture data in the tile buffer for each tile and generating at least one lower level of mipmap data from the texture data. The Examiner cites column 14, lines 36-61 and Figure 14 to compare with the means for filtering the texture data, but the Figure 14 shows the simulation of the dynamic surface such as the sea. Sanz-Pastor discloses column 14, lines 36-39 that levels of detail are generated by filtering the simulated sea geometry into progressively sparser meshes, and that this filtering process occurs for each time-step of the simulation. Thus, Sanz-Pastor teaches the simulation of sea, which is a moving body.

The simulation of the moving surface includes the change of the texture that is actually displayed. To do this, the first and second derivatives of the texture surface are derived and can be successfully displayed. This is completely different from the present invention providing the lower level mipmap data which represent the same texture data for display at different resolutions. Instead, for the lower level mipmap data, Sanz-Pastor uses the conventional image pyramid in which all the different resolutions of the texture data are stored.

In addition, the filtering of the simulated sea geometry is different from the filtering the texture data in the present invention. Rather, Sanz-Pastor's filtering process performs filtering the geometry onto which the texture is to be applied. In column 14, lines 52-55, Sanz-Pastor discloses the creation of new meshes and texture maps as time progresses

according to environmental parameters. Thus, Sanz-Pastor teaches changing the texture rather than the derivation of the mipmap chain of data from the initial texture.

Also, Sanz-Pastor does not disclose the means for temporarily storing each lower level of the mipmap data in the tile buffer. Sanz-Pastor discloses in column 13, lines 3-6 that because each layer texture is a MIP-map, <u>each layer must obtain texels from multiple texture levels via tile assembly buffer</u> 1206. However, Sanz-Pastor does not teach <u>temporarily storing each lower level of the mipmap data</u> in the tile buffer. The present invention does not need the storage for all the different levels of the mipmap data for all the textures while Sanz-Pastor does store all the different levels of the mipmap data in the image pyramid. On the contrary, the present invention teaches that the storage of one level of the mipmap texture data enables other mipmap layers to be generated temporarily as required.

The Examiner admits that Sanz-Pastor does not explicitly teach the means for storing each lower level of the mipmap data in a system main memory, wherein the filtering means and the temporarily storing means generate a predetermined number of mipmap levels to form the mipmap chain of the texture images, and cites Solomon so as to allegedly cure the deficiencies.

Solomon discloses in Figure 2 and in column 15, line 56 through column 16, line 4, the texture tile cache 232, the texture memory 234, the hierarchy cache 236, and the main memory 104. However, Solomon fails to teach <u>storing each lower level of the mipmap data in the main memory</u>.

Also, Solomon does not teach a <u>predetermined number of mipmap levels</u> to form the mipmap chain of the texture images generated by the filtering means and the temporarily storing means. Solomon merely shows <u>an example illustrating creation and use of the data structure, assuming that the top three levels of the chip pyramid are precomputed</u>.

Solomon describes a specific system for displaying VLSI layout. There would be no motivation whatsoever to combine Solomon's VLSI layout display with Sanz-Pastor's 3-dimensional rendering system because the two systems have very different purposes and structures which cause compatibility problems.

Accordingly, Claim 14 is believed to be patentably distinguishable over Sanz-Pastor and Solomon, alone or in combination with one another.

Claim 23 is directed to a method corresponding to the apparatus of Claim 14, and, therefore, is believed to be allowable over Sanz-Pastor and Solomon for the same reasons as presented above relative to Claim 14.

Claims 15-16 and 26-29 depend upon what is believed to be allowable Claims 14 or 23, and as such, are believed allowable therewith. These claims also include additional features which further distinguish over Sanz-Pastor and Solomon. For example, Claim 15 recites, "the tile buffer is used for temporarily storing image data prior to writing it to a frame buffer."
Claim 16 recites, "the frame buffer comprises a portion of the main memory." As discussed above, Sanz-Pastor does not disclose storing the image data in a tile buffer, although Sanz-Pastor teaches the sector vertex buffer 1106 for storing all the vertices to render each sector of the layer.

Claim 26 recites, "the filtering means includes a box filter." Neither Sanz-Pastor nor Solomon teaches the box filter.

Claim 27 recites, "the step of storing the texturing data associated with the image to be shielded in the system main memory before generating the mipmap chain of the texture images." As discussed above, Sanz-Pastor and Solomon do not teach even storing the texturing data in the system main memory or generating the mipmap chain of the texture images.

Claims 28 and 29 disclose the means for, or the step of, overwriting a preceding level of the mipmap data in the tile buffer with a succeeding level of the mipmap data. Sanz-

Pastor and Solomon do not teach the overwriting means for different levels of the mismap data.

For the above reasons allowance of Claims is respectfully requested. Further and favorable reconsideration is respectfully requested.

Respectfully submitted,
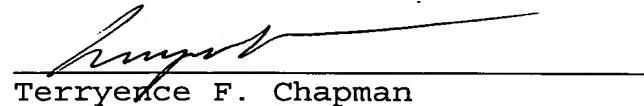
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